REMARKS

The last Office Action of September 24, 2004 has been carefully considered. Reconsideration of the instant application in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 1-22 are pending in the application. No claims have been amended, canceled, or added. No amendment to the specification has been made. No fee is due.

Claims 1, 4-18, and 21-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. No. 4,980,617 to Tajima et al. in view of U.S. Pat. No. 6,196,345 to Lyons et al.

Claims 2, 3, and 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tajima et al. in view of Lyons et al., taken with U.S. Pat. No. 5,404,418 to Nagano or U.S. Pat. No.5,459,383 to Sidman et al.

Applicant respectfully disagrees with the Examiner's rejection of claim 1 for the following reason:

Applicant's invention improves control of resonances that cause oscillatory errors in speed control, by subordinating motor speed control to oscillation control. Specifically, the output signals of the feedback elements recited in applicant's claims are negatively coupled where they are added to a desired speed signal. In contrast, the signals of feedback elements 13I-13K are not negatively coupled and are not added to the desired speed signal in Tajima. Thus Tajima is incorrectly characterized by the Office Action.

Furthermore, in Tajima, the feedback elements provide regenerative feedback that is positively coupled to a speed control signal derived from the speed error signal N_e. That subordinates oscillation control to speed control in a manner that is analogous to moving the summing point for the feedback signals B1-B3 to a point between the proportional motor controller 3 and current controller 4 in applicant's Fig. 1 and eliminating the negative coupling of that feedback.

Applicant has found that a positive coupling of the feedback signals to the motor control signal supplied by the proportional motor controller to the current controller, as shown in Tajima, causes the system to become very unstable because the speed controller and the current controller work against each other. This instability makes suitable control parameters very difficult to find, degrading the performance of the speed control system.

Furthermore, as best understood, Lyons is cited by the Office Action to show that position sensors may be used on tool shafts (non-collocated) as well as motor (collocated) shafts. However, the Sidman et al. patent cited below distinguishes the requirements of the collocated or near-collocated shaft oscillation control problems it addresses, from non-collocated shaft oscillation control that was prior art to the invention of Sidman et al. and Lyons does not suggest that its sensors are suitable for motor shafts. Therefore the combination of Tajima and Lyons is improper.

The rejection of claims 2, 3, and 19-20 under 35 U.S.C. 103(a) as obvious over Tajima et al., in view of Lyons et al. taken together with Nagano and

Sidman et al. is hereby respectfully traversed for the reasons given above with respect to Tajima et al. and Lyons.

Furthermore, the filters disclosed by Sidman are notch and lowpass filters, col. 1, lines 32-37 and col. 2, lines 2-8, not applicant's bandpass and highpass filters. Thus Sidman is mischaracterized in the Office Action.

Also, Nagano's highpass filter 12 provides a signal that controls the main filter 9 that processes a speed control signal derived from the speed error signal. Nagano's highpass filter 12 does not provide a regenerative feedback signal that is coupled to that speed control signal, as shown by Tajima. Therefore the combination of Nagano with Tajima is improper.

For the reasons set forth above, it is applicant's contention that neither Tajjima et al., nor Lyons et al., nor Nagano, nor Sidman et al., nor any combination thereof teaches or suggests the features of the present invention, as recited in claim 1.

As for the rejection of the retained dependent claims, these claims depend on claim 1, share its presumably allowable features, and therefore it is respectfully submitted that these claims should also be allowed.

Applicant has also carefully scrutinized the further cited prior art and finds it without any relevance to the newly submitted claims. It is thus felt that no specific discussion thereof is necessary.

Applicant believes that when the Examiner reconsiders the claims in the light of the above comments, he will agree that the invention is in no way properly met or anticipated or even suggested by any of the references however they are considered.

In view of the above presented remarks and amendments, it is respectfully submitted that all claims on file should be considered patentably differentiated over the art and should be allowed.

Reconsideration and allowance of the present application are respectfully requested.

Should the Examiner consider necessary or desirable any formal changes anywhere in the specification, claims and/or drawing, then it is respectfully requested that such changes be made by Examiner's Amendment, if the Examiner feels this would facilitate passage of the case to issuance. If the Examiner feels that it might be helpful in advancing this case by calling the undersigned, applicant would greatly appreciate such a telephone interview.

Respectfully submitted,

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